

RESPONSE TO OFFICE ACTION

A. Status of the Claims

Claims 1-23 were originally filed with the application. Claims 24-26 were added. Claims 13 and 19-23 were withdrawn from consideration as directed to a non-elected invention. Claims 1 and 15 have been amended to more clearly claim the Applicants' invention and to correct typographic errors. Support for the amendment of claims 1 and 15 is found in the Specification and claims, for instance in claim 7 as originally filed, and at page 6, lines 7-10. No new matter is added. Claims 5-9, 12, 14, 16-18, and 24 are cancelled without prejudice. Claims 1-4, 10, 11, 15, 25, and 26 are submitted herein for reconsideration.

B. Rejections Under 35 U.S.C. §103

The Action maintains the rejection of claims 1-12, 14-18, and 24-26 as obvious over Heim *et al.* (U.S. Patent Application Publication No. 2003/0188345A1, filed June 28, 2001), in view of Lange *et al.* (U.S. Patent No. 5,939,539) and Ebinuma *et al.* 1997 (*Proc. Natl. Acad. Sci. USA* 94:2117-2121). Specifically, the Action states that Heim *et al.* disclose use of a plant cell non-lethal negative selectable marker (*e.g. codA*) in vector backbone DNA for combined positive/negative selection, Lange *et al.* teach a plant hormone degradative/modifying gene as a selectable marker, and Ebinuma *et al.* teach use of the isopentenyl transferase gene (*ipt*) as a selectable marker. Thus it is asserted that it would have been *prima facie* obvious for one of skill in the art to modify the teachings of Heim *et al.* with those of Lange *et al.* and Ebinuma *et al.* Applicants respectfully traverse in part, and note that claims 1 and 15 have been amended.

Regarding claims 5-9, 12, 14, 16-18, and 24, the rejection is moot in view of their cancellation. Regarding claims 1-4, 10, 11, 15, 25, and 26, Applicants note first that the

amendment of claims 1 and 15 renders moot the obviousness rejection in view of Heim, Lange, and Ebinuma, for instance in that terms such as “metabolic interference” and “cytokinin pathway substrate-diverting gene” are no longer recited. Further Heim *et al.* do not teach use of a gibberellic acid pathway substrate-diverting gene as is now claimed, and neither Lange nor Ebinuma cure this defect, or describe or teach use of a “gibberellic acid pathway substrate-diverting gene” as is presently claimed.

The Action asserts that it would have been *prima facie* obvious to modify the teachings of Heim to use other negative selectable marker genes such as those taught by Lange or Ebinuma, Applicants respectfully maintain that the assertion that Heim motivates the use of “any” non-lethal selectable marker, let alone “other” non-lethal selectable markers, is unsupported and represents hindsight reasoning. Applicants respectfully ask that the Examiner point to any teaching of Heim that relates to use of “any” negative selectable marker gene. Heim is largely concerned with preparing a plant transformation vector that is small in size. The entirety of the teachings of Heim specifically regarding a negative selectable marker are found in one sentence at paragraph [0023]. No possible negatively selectable markers other than *codA* of Gallego are contemplated. A *prima facie* case of obviousness has therefore not been established.

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. M.P.E.P. § 2143.03; *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (CCPA 1974). As noted previously, Lange does not describe use of gibberellin 20-oxidase (GA 20 oxidase) as a selectable marker, including use as a non-lethal selectable marker. Rather, use of the GA20 oxidase by Lange is in the context of its effect on plant growth characteristics due to up-regulation or down-regulation of GA synthesis (*e.g.* Lange, U.S. Patent 5,939,539; column 17, line 45, to column 18, line 34), including instances where GA 20-

oxidation is a rate limiting step (Lange, column 18, lines 10-11). In view of Lange, given sequences involved in GA synthesis are thus required to be present for an effect such as altered vegetative growth to be seen. However, this teaches away from use of, for instance, GA 20-oxidase sequences, as a negative selectable marker, since loss of a GA 20-oxidase gene would be understood by the skilled practitioner, in view of Lange, to lead to loss of a desired phenotype, and would thus be avoided by a practitioner in view of the teachings of Lange, *i.e.* by selecting for the presence of a GA 20-oxidase gene sequence (or complement) as desired. Simply put, Lange in no way teaches suggests or contemplates that a GA20-oxidase or any other gene involved in GA synthesis is to be used as a negative selectable marker, for instance to be placed outside of the border sequences on a vector designed for *Agrobacterium*-mediated transformation and then selecting for loss of the presence of the gene and associated vector sequence.

Further, the *codA* gene described by Heim and Gallego is not described as a plant hormone synthesis or substrate diversion-related gene, but is instead a metabolite interference gene, as is explicitly conceded by the Action at page 4, last two lines. Applicants again note that claims 1 and 15 have been amended, and no longer recite “metabolic interference gene”. Finally, Ebinuma is cited for its use of a cytokinin synthesis-related effect. Applicants respectfully submit that whether or not an *ipt* gene involved in cytokinin synthesis may function as described by Ebinuma is irrelevant to the presently claimed invention, and does not cure the defect of Heim in view of Lange.

Applicants also respectfully submit that the described unexpected result, that is the effect of the presence of a gene such as *crtB* in inhibiting regeneration of transgenic plants that contain backbone sequences, and leading for instance to an unexpected increase in the percentage of single-copy transformants, is commensurate with the scope of the present claims. The Action of

September 2007 does not dispute the unexpectedness of these results at least as they relate to a gibberellic acid pathway substrate diverting gene (*errB*; *e.g.* Action, page 7).

In light of all the above, Applicants respectfully request that the rejection under 35 U.S.C. §103 be withdrawn.

C. Conclusion

In light of the foregoing, applicants submit that all claims are in condition for allowance, and an early indication to that effect is earnestly solicited. The examiner is invited to contact the undersigned at (214) 259-0932 with any questions, comments or suggestions relating to the referenced patent application.

Respectfully submitted,

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